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GAS VOLATILITY & TRANSPORTATION VALUATION

CONFERENCE

September 25-27, 2002 • Houston, TX

Featuring Presentations From:

Duke Energy Gas Transmission
Energy and Environmental Analysis
Henwood Energy Services, Inc.
Lehman Brothers
Levitan & Associates, Inc.
Lukens Energy Group, Inc.
PG&E National Energy Group
Platts Research & Consulting/RDI
The Northbridge Group
RBA Consultants
Skipping Stone

Learn how to attack one of the thorniest problems in energy marketing—quantifying and managing gas volatility and transportation valuation:

- **Measure, Estimate and Model Gas Price Volatility**
- **How to Value Gas Transportation Incorporating Fundamental and Options Drivers**
- **Wresting Value from Gas Price Volatility in Transportation Networks**
- **Gas Volatility and Network Effects on Value**

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Dear Colleague:

It is a vast understatement that companies involved in selling gas and gas transmission services have seen drastic changes to their operations in the past year. Companies have shed capital-intensive speculative trading operations, while the volatility of gas prices has continued at record levels, putting additional pressure on those operating and using the services of gas pipeline networks to effectively hedge physical trades and monetize the extrinsic value of their networks. If you are buying or selling gas, you need to know how to assess and manage gas price volatility to achieve better business results. The problem is that standard models are notably inadequate in their ability to capture price volatility observed in gas markets, and conventional decision-making methods do not properly address the impacts of price volatility.

Infocast's **Gas Volatility and Transportation Valuation** is a tightly focused program specifically designed to attack the problems of modeling volatility in today's gas markets. The program offers you an in-depth examination of proven techniques to accurately incorporate price volatility into transportation valuation. The goal is to help you understand the value drivers of gas transportation, how to quantify them, and how to monetize them.

This in-depth program focuses on:

- Ways to measure, model, and estimate gas price volatility
- Methods for valuing gas transport
- Wresting value from gas price volatility
- Monetizing value from transportation through operational and hedging strategies

Gas Volatility and Transportation Valuation is a great opportunity to learn ideas and state-of-the-art techniques from leading industry experts. Don't miss this superb event—register today!

I look forward to seeing you in Houston, September 25-27, 2002.

Sincerely,

Mike Reed
Vice President, Market and Quantitive Analysis
PG&E National Energy Group

LEARN FROM THE EXPERTS!

Distinguished Faculty

Eric Alam, *Principal, Wholesale and Risk Practice*, SKIPPING STONE
Mr. Alam has over twenty years of energy management experience. He has had senior management roles in the development and implementation of integration plans for wholesale and retail markets in both power and gas, as well as the structuring desk function to facilitate wholesale/retail trades and optimize assets under company management.

Robert E. Brooks, Ph.D., *President*, RBA CONSULTANTS
Dr. Brooks is noted for designing the first comprehensive model of the North American natural gas pipeline system in 1974-75, and has remained active designing models of gas transportation systems for FERC, DOE, Texas Energy and Natural Resources Advisory Council, as well as the GPCM Natural Gas Market Forecasting System for mid- to long-term gas price and flow scenario analysis and forecasting.

Richard Carlson, Ph.D., *Director, Risk Analytics Software Products,* HENWOOD ENERGY SERVICES, INC.
Richard Carlson's experience at Henwood has included development of new tools and techniques for real options valuation of generation assets, econometric analysis of electric energy and ancillary services prices, and modeling of potential market power, including RISKSYM, PositionReporter, and MarketPlace.

Richard Levitan, *President*, LEVITAN & ASSOCIATES, INC.
Richard Levitan has 24 years of financial and market experience specific to the energy industry. Since founding LAI in 1989, Richard has led the firm's advisory services in the areas of power plant valuation, energy contracts, natural gas pipeline transportation management, and mergers and acquisitions.

Jay Lukens, Ph.D., *President & CEO,* LUKENS ENERGY GROUP, INC.
Jay Lukens has over twenty years of diverse, senior level corporate and consulting experience within the energy and telecommunications industries. Lukens Energy Group is noted for helping companies use leading-edge methods of financial engineering, risk management and economic analysis to value and monetize both the intrinsic and extrinsic value embedded in energy assets and transactions.

Tom Parkinson, Ph.D., *Director,* THE NORTHBRIDGE GROUP
Dr. Parkinson applies the financial theory of commodity and derivatives markets to practical problems facing managers in the energy industry. These applications chiefly include market-based planning, asset and contract valuation, and probabilistic price forecasting.

Kevin Petak, *Director, Energy Modeling and Forecasting,* ENERGY AND ENVIRONMENTAL ANALYSIS
Mr. Petak has directed numerous energy market analyses to support strategic planning needs at energy companies, including natural gas producers, pipelines, and energy marketing affiliates. These analyses have investigated the impact of pipeline expansions on gas prices, the effect of weather on gas markets, compliance with stricter emissions regulations, use of oil backup in power generation for system reliability, the impact of declining productivity on gas prices, and gas industry security concerns.

Mike Reed, *Vice President, Market and Quantitative Analysis,* PG&E NATIONAL ENERGY GROUP
Mr. Reed leads a team whose responsibilities include, for both gas and power, fundamental research, analysis, and forecasts, as well as quantitative toolset identification, design, and implementation. Past roles include serving as Vice President, Strategy & Valuation, for Coral Energy, and as Vice President, Securities Investment Group, at Koch Industries.

Steve Reich, *Director, Market Assessment,* PG&E NATIONAL ENERGY GROUP
Steve Reich has over fifteen years' experience in natural gas transportation. He is the Director, Market Assessment, at PG&E National Energy Group where he is responsible for the fundamental analysis of the North American gas market. Prior to joining the NEG, Mr. Reich was a Principal at ICF Consulting and Director of its Gas Markets Practice where he managed ICF's contribution to the development of the world's first gas ISO in Victoria, Australia.

Gregory J. Rizzo, *Senior Vice President, Marketing and Capacity Management*, DUKE ENERGY GAS TRANSMISSION
Gregory Rizzo is Senior Vice President of Marketing and Capacity Management, for Duke Energy Gas Transmission (DEGT), the natural gas pipeline group of Duke Energy. He is also the recipient of Duke Energy's 1998 Pinnacle Award, which recognizes Duke Energy employees for outstanding contributions to the company's business success.

Todd Strauss, Ph.D., *Director, Quantitative Analysis,* PG&E NATIONAL ENERGY GROUP
Todd Strauss leads the development of PG&E National Energy Group's asset valuation tools. Dr. Strauss has more than a decade of experience developing and applying quantitative models to business issues in the electric power and natural gas industries.

LEARN TO MEASURE VOLATILITY AND

Full-day pre-conference workshop:
Wednesday, September 25, 2002 • 8:00 AM to 5:00 PM

MEASURING, MODELING, ESTIMATING, AND USING GAS PRICE VOLATILITY

Your Workshop Instructors:

Richard Carlson, Ph.D., *Director, Risk Analytics Software Products,* HENWOOD ENERGY SERVICES, INC.
Tom Parkinson, Ph.D., *Director,* THE NORTHBRIDGE GROUP
Todd Strauss, Ph.D., *Director, Quantitative Analysis,* PG&E NATIONAL ENERGY GROUP

DEFINING AND MEASURING VOLATILITY

While everyone knows that volatility is a measure of the rate of price uncertainty, the concept is widely misunderstood and misapplied. This session will provide an intuitive basis for the definition of volatility, illustrate the basic mechanics of volatility measurement, and relate these measurements to risk management and option pricing.

- Why is volatility defined the way it is?
- How can volatility be measured?
  - Marginal volatility using forward and spot prices
  - Average volatility using options
- How can marginal and average volatilities be related?
- How can volatility estimates be used?
  - Identifying portfolio risk using marginal volatility
  - Valuing options using average volatility

Morning Refreshment & Networking Break

MODELING VOLATILITY

The unique characteristics of energy markets require customized volatility models. This session will examine a variety of financial and econometric models developed by financial experts, and explore how to adopt and customize them appropriately for gas markets. An important distinction will be made between systematic drivers of price changes, and random shocks. Models that will be discussed include:

- Geometric Brownian motion
- Mean reversion and jump diffusion
- Single-factor and multi-factor
- Stochastic volatility: GARCH and Markov regime-switching

Group Luncheon

ESTIMATING VOLATILITY

Using volatility models in practice requires a blend of seasoned energy business judgment and high-quality analytic skills. This session will discuss issues in specifying, estimating, calibrating and validating models of gas price volatility. Using actual market data, you will be shown how to:

- Estimate simple mean reversion and Markov regime-switching spot price models
- Calibrate spot and futures price volatilities
- Incorporate seasonal and fundamental price drivers into volatility models
- Use business-oriented metrics to compare models
- Apply procedures for validating models

Afternoon Refreshment & Networking Break

USING VOLATILITY IN FINANCIAL OPTIONS AND REAL OPTIONS

Real options analysis for gas assets melds financially-oriented options models with physically-oriented operational models. This session will present the foundation of financial options valuation, compare financial options to real options analysis, and discuss how real options analysis may be used in valuing and managing gas assets. Topics that will be discussed include:

- Why (and how) the risk-free interest rate and risk-neutral probabilities are used
- What delta is, and how it is used in dynamic hedging
- Ways to bridge the gap from financial options analysis to real options analysis
- The differences between strategic and tactical applications of real options analysis for gas assets

WREST VALUE FROM GAS TRANSPORTATION

PROGRAM OUTLINE

THURSDAY, SEPTEMBER 26, 2002

WELCOME AND OPENING REMARKS BY PROGRAM CHAIR

Mike Reed, *Vice President, Market and Quantitative Analysis,* PG&E NATIONAL ENERGY GROUP

Session One

Methods of Valuing Gas Transport

FUNDAMENTAL MODELING OF THE GAS NETWORK

This presentation will discuss the structure and operation of RBA Consultant's GPCM Natural Gas Market Forecasting System. GPCM is a model of the North American gas pipeline and storage system. The model explicitly represents 160 existing and proposed pipelines and over 140 pipeline, LDC, and merchant storage operations. GPCM computes average monthly market clearing prices at hundreds of points and flows throughout the pipeline and storage infrastructure for scenarios running from 1998 through 2020. It also calculates the value of transportation in each modeled pipeline segment as affected by supply and demand conditions throughout the continent, congestion on the grid, and storage availability. Issues to be discussed:

- Basic model structure
- Data requirements
- Calibration of the model
- Valuation of transportation
- Market clearing methodology
- Recent results
- Adapting to changes in regulation and the market

Morning Refreshment & Networking Break

SPREADS AND SWINGS: OPTION VALUATION OF GAS TRANSPORT

Gas transport is a means to monetize the spread between prices at receipt and delivery locations. Gas transport may be valued as an option on this spread. Volatility and correlation are key ingredients to this valuation. Issues that will be discussed in valuing gas transport include:

- Volatility and correlation as drivers of transport value
- The differences between regional and long-haul pipe
- Swing, secondary firm, and interruptible
- Valuation on a transportation network

LINKING FUNDAMENTAL AND FINANCIAL OPTIONS MODELING

Fundamental modeling focuses on drivers of supply and demand, the resulting price equilibria (short-term and especially long-term), and an asset's (and asset owner's) relative positioning. Financial options modeling focuses on market prices and price uncertainty, and how an asset's operating characteristics enable it to respond to changes in market price movements. Usefully linking the two approaches is an important element for success in today's natural gas industry. Issues in linking the two approaches include:

- Calibrating fundamental models to market price data
- Incorporating fundamental drivers into financial options models
- Systematically identifying gaps between fundamental and financial models, and ways to successfully bridge them

Group Luncheon

Session Two

Wresting Value from Gas Price Volatility

VALUING (AND MONETIZING) PIPE AND STORAGE TOGETHER

Pipeline and storage facilities are both key elements in transporting natural gas across regional and national networks. The synergies of pipeline and storage carry through from operations to valuation. This presentation will focus on valuing and monetizing these synergies. Topics to be discussed include:

- How locational spreads are captured with storage
- Effects of storage on basis volatility and value
- Adjusting location spread models for storage effects
- Approaches for integrated modeling of pipe and storage

Afternoon Refreshment & Networking Break

OPTIMIZING ACROSS THE GAS VALUE CHAIN

Physically, the natural gas value chain spans from exploration and production, through long-haul and regional transport, to local distribution and burner tip consumption. Functionally, marketing and trading enrich the picture. Integrated management reduces risk and creates value. Topics that will be discussed include:

- Coordinating physical operations and financial trading
- Marketing both standard products and customized structures

- Making decisions off information and views held in common across the enterprise
- Distributing risk efficiently across the enterprise, its suppliers, and its customers

ROUNDTABLE ON GAS VOLATILITY AND EARNINGS

Moderator:
Mike Reed, *Vice President, Market and Quantitative Analysis*, PG&E NATIONAL ENERGY GROUP
Panelists:
Rick Gross, *Natural Gas Analyst*, LEHMAN BROTHERS
William McAleb, *Managing Director,*
PLATTS RESEARCH & CONSULTING/RDI

Cocktail Reception

FRIDAY, SEPTEMBER 27, 2002

Session Three

Gas Volatility and Network Effects on Value

CAPACITY EXPANSION AND ITS EFFECTS ON BASIS SPREADS

A new pipeline brings revolutionary change. These changes can be as simple as increasing access to supplies in a congested region or eliminating the reliance on higher cost supplies from elsewhere. The ramifications extend beyond the boundaries of the pipeline's target market, as new competition arises in supply basins or supplies backed out from one market find another to inhabit. All these changes can be counted on to alter how basis spreads are determined and how sensitive they are to the fluctuations of the market. This presentation will discuss the role of pipeline expansions in changing basis spreads including:

- The role of pipelines as transmitters of market signals
- The different impacts of market pull and supplier push
- Quantifying 1st and 2nd order effects of pipeline proposals
- Identifying potential effects of proposed pipes

WHITHER REGIONAL GAS MARKETS?

This presentation will discuss regional natural gas market trends over the next ten years. Regional growth of natural gas demand will be addressed in light of the vast amount of gas-fired power generating capacity currently under construction. Growth of gas supply, particularly from new producing frontiers, like the deeper waters of the Gulf of Mexico, Mackenzie Delta, Alaska, and LNG will be discussed. The likely impact of demand growth and supply shifts on basis spreads and value of gas transmission and storage assets will be examined. This presentation addresses the following questions:

- How much will regional gas demand grow, and what factors will drive it?
- Where is gas supply likely to come from?
- Is energy security an issue?
- How are demand growth and new gas supplies likely to affect the value of transmission and storage assets?
- What are the implications for the North American energy market?

Morning Refreshment & Networking Break

MEASURING AND MONETIZING INTRADAY VOLATILITY

Value lies in the interplay between real-time operations of pipelines and intraday fluctuation in market prices. But intraday price signals are not yet clear. It is challenging to quantify intraday volatility and its contribution to asset value. Topics that will be discussed include:

- How pipeline operations create intraday volatility
- Using econometric and fundamental models to estimate intraday volatility
- Modeling the value of intraday volatility
- Using physical assets and trading to monetize the value of intraday volatility

HOW TO VALUE THE EXTRINSIC OPTIONALITY ASSOCIATED WITH A TRANSPORTATION NETWORK

Transportation can be viewed as a series of location spread options, which determine both the intrinsic and extrinsic value of the asset. As natural gas pricing changes with time based on prices, volatility, correlations, and price jumps, the short-term value of natural gas transportation assets and contracts has become more difficult. The user must define the key components that affect the value of natural gas transportation such as basis locations, constraints, segmentation capabilities, and path dependencies to effectively model the extrinsic optionality. This presentation will discuss:

- The theory behind modeling extrinsic optionality in a transportation network
- Examples of how value changes in a network with changes in routing alternatives
- Examples of how the addition of receipt and delivery points affects value

CONCLUDING REMARKS BY PROGRAM CHAIR

Mike Reed, *Vice President, Market and Quantitative Analysis,* PG&E NATIONAL ENERGY GROUP

Conference Adjourns

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JIM NAPHAS
Conference Manager,
INFOCAST

I welcome your questions and comments about this program, and I am available to discuss your ideas for future conference topics.

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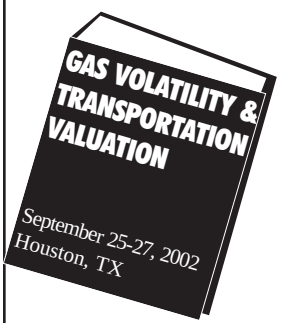

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Hi, I'm Hiedy Vitug, Director of Infocast's Preferred Customer Services. You may not know it, but Infocast's website has a special Preferred Customer page offering special discounts for repeat customers. You can access it by going to www.infocastinc.com and clicking on the "Preferred Customer" link, then typing in your name (the same way you were listed when you registered for a previous Infocast event).

Call me or visit the Preferred Customer page on our website—you'll be glad you did!

Sincerely,

P.S. - If you still aren't convinced, read the valued comments from some who have benefited from our Preferred Customer Service:

"Thanks for your usual great personal attention and customer service, a hallmark of Infocast as far as I'm concerned."
Stephen E. Kaminski
New Hampshire Electric Cooperative, Inc.

"For the last three years Infocast has been a partner in my training needs. The cornerstone of such relationship is Infocast's customer service, in particular Hiedy Vitug's efforts. Hiedy keeps me informed of new courses in my area of expertise and is always willing to work with me to accommodate my needs. I look forward to continuing our successful partnership."
Luis Fondacci
NCEMC

"Infocast's customer service people make sure they know what subject areas are important to me then keep me informed of all the right upcoming events. Since I know the schedule of events, usually way in advance, I can plan my attendance to get the most out of the time I allocate to conferences. This matters to me because I find these conferences are the best way to keep current in my industry."
Peter Burke
American Transmission Company (ATC)

"You have been very prompt and attentive to my requests, and, on top of that, always very pleasant in demeanor. It's always good to have someone on which to rely to get the job done."
Joan Herrigus
Wisconsin Electric Power Co.

Gas Volatility & Transportation Valuation

September 25-27, 2002 • Marriott West Loop • Houston, TX

REGISTRATION INFORMATION

TUITION:	EARLY BIRD	STANDARD	GOV'T
Conference	$1,250.00	$1,395.00	$975.00
Pre-conference Workshop	$725.00	$795.00	$550.00

The full tuition is payable in advance and includes program instruction, refreshments, luncheons, cocktail reception and complete conference documentation.

DOCUMENTATION
Each delegate will receive documentation prepared specifically for this conference.

DISCOUNTS
Early Bird Discount: Applies to registrations received no later than August 23, 2002 (see above for pricing).
Government Discount: For U.S. Federal, State or Local Government Employees (see above for pricing).
Team Discount: For teams of three or more from the same organization, the third and subsequent registrants qualify for a 50% discount (applies to full-price registrants only).

PROGRAM SCHEDULE
Wednesday, September 25, 2002
7:30 a.m. - 8:00 a.m. Pre-conference workshop registration
8:00 a.m. - 5:00 p.m. Pre-conference workshop in session
Thursday, September 26, 2002
7:00 a.m. - 8:00 a.m. Conference registration
8:00 a.m. - 5:00 p.m. Conference in session
Friday, September 27, 2002
8:00 a.m. - 11:45 a.m. Conference in session
11:45 a.m. Conference adjourns

ACCOMMODATIONS
Infocast has secured a limited number of rooms at the Marriott West Loop by the Galleria, which will be held at a special rate of $169.00 until September 2, 2002. To receive the special rate, call the hotel directly at 1-800-613-3982 and mention that you are an Infocast registrant. The hotel is located at 1750 West Loop South, Houston, TX 77027.

CONTINUING EDUCATION CREDITS. Infocast certifies that this activity has been approved for MCLE credit by the State of California in the amount of 10.0 hours for the conference only and 15.0 hours with the pre-conference workshop. MCLE hours are subject to change.

CANCELLATION, REFUND & CREDIT
Should you be unable to attend, a refund, less a $50 administrative charge, will be made for cancellations received via letter or fax at least 10 working days before the program. We will be pleased to transfer your registration to another member of your company, or credit the registration fee to another Infocast program if you register within six months from the date of this program. In the event the program is canceled, Infocast's liability is limited to refund of the program registration fee only.

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	EARLY BIRD	STANDARD	GOV'T	
Conference	$1,250.00	$1,395.00	$975.00	
Pre-Conference Workshop	$725.00	$795.00	$550.00	
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